

**ABSTRACT OF THE DISCLOSURE**

The present invention relates to the identification in vertebrate animals, including  
5 humans, of an ion channel which is involved in osmoregulation and  
mechanoreception. This ion channel, named VR-OAC, functions as a cation  
channel which is activated by osmotic and mechanical stimulation. In particular,  
the present invention relates to the broad applications of VR-OAC that capitalize on  
its newly discovered properties and activities, including both diagnostic and  
10 therapeutic methodologies. The invention further relates to methods for using the  
receptor therapeutically, such as polypeptide or gene therapy, diagnostically. and to  
methods and assays for identification and screening of VR-OAC analogs, agonists  
or antagonists and uses thereof.